Fish Lake geology

FILE NOTE

Date: 26th June 1981

From: I.M. Mason

Re: PRELIMINARY GEOLOGICAL EXAMINATION OF FISH LAKE PROPERTY (Comments and Recommendations)

Introduction

Clearly the worth of the Fish Lake prospect will eventually shine through the gloom currently being cast by the overhanging hulk of Valley Copper but, whether this be sooner or later, there remains several directions along which work should proceed immediately.

These involve:-

A) Work leading to a better understanding of the Fish Lake property as a porphyry copper/gold open-pit proposition;

B) Evaluation and exploration of known gold occurrences within the area of this open-pit as a separate and preferably initial project;

C) Preliminary exploration of gold potential within the area of the new claims on the basis of geology learned in the current season.

The recommendations presented here have already been discussed with M.J. Osatenko and A. Pauwells and their importance has been agreed on at this level but, since the proposed work will involve more expenditures than previously envisaged, the following is prepared as a basis for consideration of a supplementary work proposal.

A. Fish Lake as a Porphyry Copper

The significance of the Fish Lake property will eventually rest on its reserves of Cu/Au, but whether work continues apace to the feasibility stage or it is left to simmer on the hob, it is recommended that work on three fronts would be most appropriately carried out immediately since they will affect the light in which the property is viewed. They are given in my order of priority.

1) Re-Logging Core

Since Phelps Dodge first located evidence of porphyry mineralization in 1960 the property has been explored by 5 separate companies.

i) Phelps Dodge 1960-65: Hand-dug trenches
10 short core holes (in pyrite zone)

..2/

ii)	Taseko Mines 1966-present: (retained interest)	Trenching, 12 percussion holes; 6 B.Q. core holes
iii)	Nittetsu Mining 1970-71: (option)	I.P. and geochem. survey 3 short B.Q. holes
iv)	Quintana Minerals 1972-75: (option)	Trenching, 15,000' N.Q. & H.Q.(+ percussion?)
v)	Bethlehem Copper 1980-81: (option)	29,000' N.Q.+ percussion drilling on 500 m grid.

While the full data from i) and ii) has not yet been located, there remains a considerable amount of information; particularly the core drilling of Quintana and Bethlehem. The bulk of the split-core from these programmes remains on the property. While logs for this 44,000' are available, they have been compiled by several (6?) different geologists and one man's plagiclase porphyry is clearly (almost) the same as another man's diorite, similar changes in emphasis affect the interpretation of the alteration. Sections drawn on the basis of these logs will give, at best, an unnecessarily confused picture and, at worst, could lead to erroneous assumptions important to mining.

A. Pauwells, who already has familiarity with the project, is currently re-logging the Bethlehem holes. This must be extended to the Quintana holes to give an internally consistent frame-work for future research and understanding of the geology. This will include the unpleasant and messy job of rehabilitating approx. 4,000' of H.Q. core in cardboard boxes which has been sadly treated over 5 years by a family of pack-rats who considered their squatters-rights included using the boxes as nest-building material and the core as a quaint toilet. (While the dilapidated boxes have led to jumbling of the core we are fortunate in that each box contains only 10' of core in 2' runs so that, with care, depths should never be out more than 2', or at worst, 10'. For this, Andre will require 2 students equipped with gallons of disinfectant, gas-masks and rubber gloves - I must remember not to lick the core - plus 4,000' of wooden H.Q. boxes.

A.P. and M.J.O. seem to have reached agreement on the features of lithology, alteration, fracturing and mineralization that should be stressed in this re-logging. This may require one month, or longer, if further features are recognized to be important after this initial logging.

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2) Alternative Logging Techniques

Important aspects of understanding the geology of porphyry deposits is the recognition of the number of separate rock-types involved both in the pristine aspect of civilian dress and in the several uniforms of the various alterations and, also, to recognize the zonation of the alteration itself:- both are important in predicting variations in grade. At the moment there is some uncertainty of the recognition and the location of the biotite-zone and, also, there is a deal of subjectivity on the distribution of the chlorite and sericite zones(1)

The biotite problem is essentially one of K-abundance. Radio-metric logging of the holes should objectively outline zones of K-enrichment if the uranium content is not too high. Since the casing has been left in all Quintana and Bethlehem holes and since Bethlehem were able to easily re-enter the 7 year old Quintana holes, it will be worth while to test this with the Cominco Mt. Sopris unit. (Recommend a separate wire winch with a length of B rod to initially clean out any small obstructions that may hamper descent of probe).

Observations of the core indicate that in clearly sericized rock the dominant iron-oxide is hematite while in the chlorite zone magnetite predominates. A survey of the core with the Scintrex hand-held susceptibility meter could give relevant and objective data which can be used for inter-hole correlation.

3) Geology/Geochemistry/Geophysics

Exploration to date has concentrated exclusively in an area of about 1 mile square round the known mineralization: the property (old claims) is some 6 x 2½ miles with 'diorite' interpreted as occurring both NW and SE from this zone (Fig.1)

While increasing the size of the deposit will be of interest, an increase of 50% or even 100% will not drastically change the impact of the property if the grade remains the same. More profitable would be the location of a separate system with the Cu grades of, say, Valley Copper, and the same gold grades. This is a very credible proposition in this type of ore deposit and is a hypothesis that, therefore, must be tested.

(1) I detect a propensity to assume a classical bulls-eye pattern of zonation that colours interpretation: "if this is line 10N it must be chlorite".

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The objective of the first stage in such testing will be to locate indications that another system does occur. This should involve three preliminary surveys of geology, geochemistry and I.P. - all of which have already been proven to be able to detect the known mineralizations and should be extended to cover the balance of the old claims.

The bush in the area is open pine forest and meadows and line-cutting should not be required for reconnaissance work. Two orthogonal wide, cut-lines are already present over the deposit and a base line could be easily extended. A consensus on line-spacing can be reached - perhaps 100 meter for geochemistry and 500 m for I.P. Indications of mineralization can be later followed up with percussion drill holes, prior to diamond drilling. If the percussion stage is reached, exploration drilling through the basalt covering the flanks of the diorite could be then considered (Fig. 1).

Already planned

B. Gold Potential in the Area of the known Cu/Au Mineralization

30 years before Phelps Dodge discovered intimations of copper, while the area was trackless and virgin ground 150 miles NW of Bralorne, prospectors had located evidence of vein gold mineralization in two zones approx. 1500 m north east of the centre of the probable Fish Lake open pit. Small hand pits and a shack date from this period. Although not completely ignored the Cu/Au mineralization has overshadowed these occurrences, but Bethlehem Copper has explored these areas with 9 wide-spread percussion holes and 6 diamond drill holes (Figs. 2-8). A puzzling feature is that in two cases where there are adjacent DDH and percussion holes, the percussion holes consistently give higher assays. This could be due to; a) inherent variation, common in vein deposits; b) a difficult-to comprehend mechanical concentration of gold in the percussion holes; and c) core loss in critical zones (fractured) in the diamond drill holes.(1)

Nevertheless the assays from this work, in my view, clearly deserve immediate attention because if there is a significant deposit (say even 1 m tons of 0.2 oz or large tonnage of 0.05 oz) this will have to be dealt with by a separate mill prior to the development of the Cu/Au pit since these zones will fall within the influence of the pit.

Press file but doubtful

(1) Core was split and assayed for Cu/Au in 10' sections so presumably Au was not principle target.

In other words, the Albert and ~~Renner~~ Renner Zones should be treated as a separate programme of prime priority - this summer

Renner Zone

Percussion hole 80-33 gives 12 m/0.25 oz Au, 0.82 oz Ag

Albert Zone

DDH 81-25(1) gives
- 6 m/0.055 oz Au
- 18 m/0.019 oz Au
- 3 m/0.53 oz Au
- 9 m/0.026 oz Au

(in separate sections)

Percussion hole 79-7 gives 60 m/0.026 oz Au

Percussion hole 79-8 gives 78 m/0.03 oz Au
(including 15 m/0.03 oz Au, ~~in turn~~ including 3 m/0.13 oz Au)

Note that the assays are based on lumping rock over 3 m intervals which is exceedingly wide for vein-mineralization - if this is in fact the mode of occurrence.

Within the high grade zone of Cu/Au mineralization, the statistical correlation of Cu vs. Au of 0.95 is very impressive (0.75 for total holes) and is de facto support for presuming a genetic relationship between Cu and Au - unless, of course they are both independently correlated to a third factor, say 'favourable' host rock or structure. (Note correlations are based on zones representing 10' of section).

In gross terms while the Au content of the main mineralized zone is not unheard of within the general class of porphyries (Afton, Similkameen, etc.) it is unusual for this variety of porphyry (calc-alkaline) similar to Valley Copper, Lornex etc. On the other hand within the Fish Lake core, late stage pyrite/quartz/carbonate veins make up a modally significant proportion of the multi-veined deposit. In the Timmins, Con, Red Lake and many other gold camps pyrite/quartz/carbonate veins constitute a major source of gold. Currently, however there is no evidence to support this suggestion, although Jim MacLeod is beginning a mineralogical examination of the concentrates and tailings from the Bethlehem metallurgical tests. Nor is there a clear idea of the habit of the gold in the Albert and Renner Zone - it may be in some other form altogether.

(1) Note: in this case adjacent percussion holes give lower values

The point is that the assays and the potential for either a large low-grade or smaller, high-grade deposit is strong enough to warrant immediate attention independent of the Cu/Au deposit.

Immediate work will involve 1) re-logging of the few core holes with re-sampling at closer spaced intervals to get evidence on nature of mineralization; 2) detailed mapping perhaps including trenching in area of surface showings, to begin to determine possible structural controls; 3) detailed (25 m) geochemistry to help determine extent of areas of interest; and 4) preliminary diamond drilling for all of the above reasons plus confirmation of assays(1).

C. Gold Potential of New Claims

In the belief that the operative trend in the Fish Lake mineralization was NW/SE (approx. parallel to Yalakom Fault, Bethlehem staked a swatch of new claims SE of the deposit. A programme of mapping and geochem has been carried out over the past two months to identify areas of diorite and to cover these with soil geochem samples. Although this objective does not seem to have been achieved the mapping has located a major ultrabasic rock (at least 2,000 x 1,000 m) with an associated or, at least, nearby carbonatized pyritic shear-zone.

The general similarity of both rock types (sediments, diorites, ultramafic) and structure (Caldwaller shear zone) to the Bralorne camp(2), 150 miles SE along the dominant regional trend of the area, is compelling enough to warrant more detailed attention for gold potential.

As of yesterday (June 25) although the exposed ultramafic and the carbonatized shear zone have been sampled and will be analyzed for gold, it was not certain that any soil geochemistry or more detailed mapping will be carried out. (The recce work is being carried out by Les Kay, a consultant hired by Bethlehem (pre-Cominco) and it appears he feels that soil sampling is not what he was hired to do).

(1) It is hoped a work proposal will originate as a result of discussion of this data with FDG, MJO and AP in early July.

(2) Note general similarity in general features of lithology and structure to Timmins, Kirkland Lake, Val d'or and Yellowknife camps despite difference in age.

..7/

If AP is supplied with two or three assistants, part of this work could be done in conjunction with the Fish Lake projects. I intend returning shortly to this area to at least do some mapping in the area.

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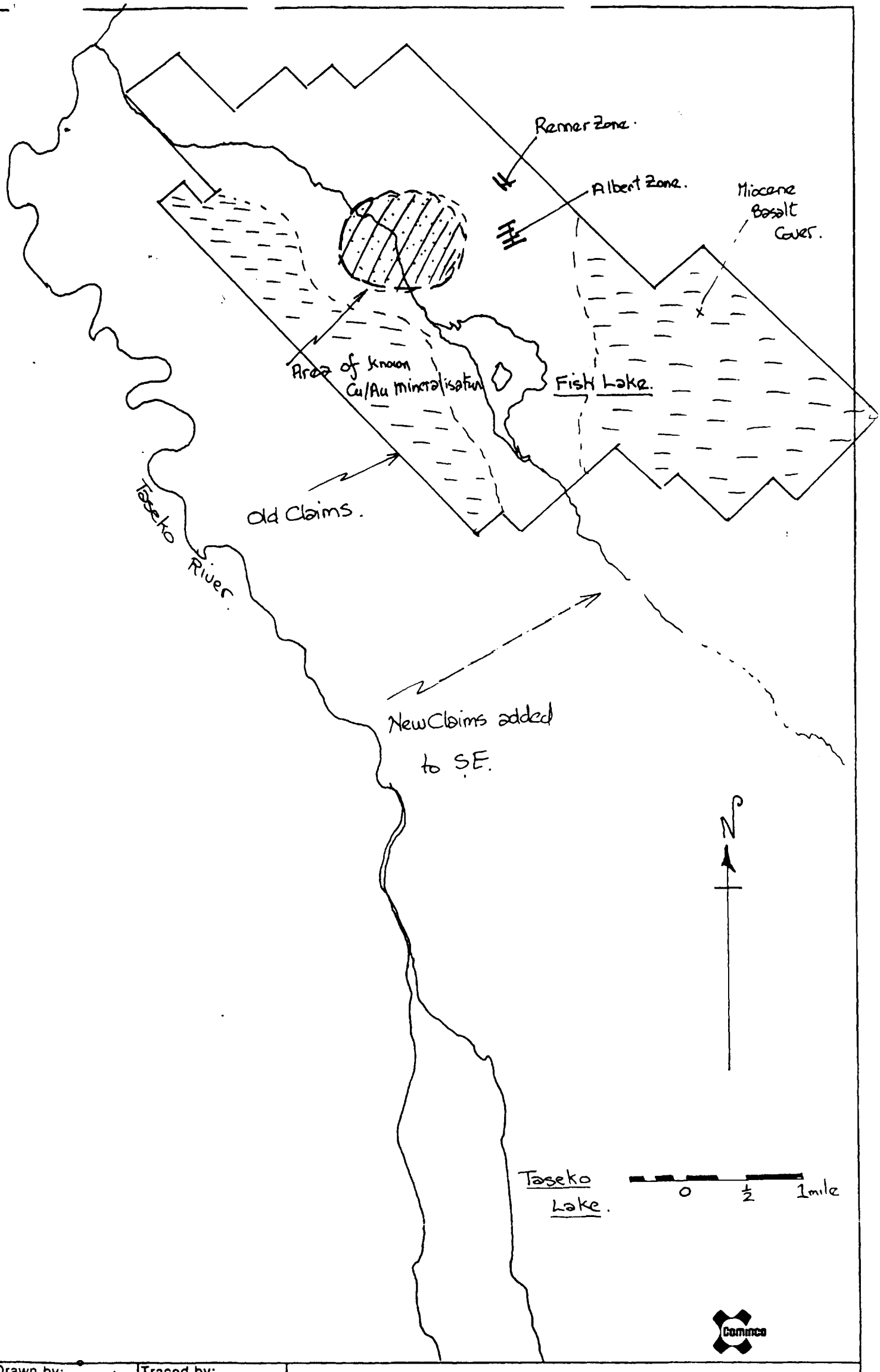

Drawn by: WM		Traced by:	
Revised by	Date	Revised by	Date

Fish Lake Project.
Location

Scale:

Date: June 29.

Plate: 1.

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